RIVERINE ASSAULT CRAFT (RAC) PROGRAM:

A CASE STUDY IN COMMERCIAL ITEM / NDI PROCUREMENT STRATEGIES

CONDUCTED BY:
DoN OFFICE OF ACQUISITION REFORM

OCTOBER, 1996

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EXECUTIVE SUMMARY

In 1986, the U.S. Congress passed legislation giving preference to the acquisition of Commercial Items and Non-Developmental Items (NDI) for military use. Since then, Commercial Item and NDI procurements have become the accepted and preferred method of fulfilling the mission requirements of the Department of Defense (DoD).

The benefits of fielding Commercial Items and NDI equipment are now widely recognized. It allows for timely deployment of world class technologies, reduced developmental risk, and the use of innovative and streamlined acquisition practices by DoD Systems Commands.

Historically however, Commercial Item and NDI acquisitions present buying activities and Systems Commands with unique acquisition and support requirements which often result in programmatic and logistic shortfalls, and increased life cycle support costs. In light of the challenges that commercial procurements present to the DoD community, it is important that program managers, logistics, engineering, and contracting personnel, learn from their past experiences, as well as those of other buying activities.

The following case study features programmatic, logistic, and engineering / design lessons learned from the Marine Corps' Riverine Assault Craft (RAC) Program. The RAC Program typifies the unique nature of Commercial Item and NDI acquisitions, and provides valuable lessons in how to make such procurements more effective and manageable in the future. The lessons learned from this study are intended to help acquisition and program management personnel become more knowledgeable and adept in executing future commercial procurements.

ACKNOWLEDGMENTS

The Department of the Navy Acquisition Reform Office (RD&A), extends its gratitude to the United States Marine Corps' Combatant Small Craft Program Office and contracting specialist personnel (Quantico, VA), for their active participation in this case study. Their professionalism, cooperation, and candor, in presenting the facts of the RAC procurement was instrumental in obtaining valuable lessons learned for the acquisition community.

ACRONYM LIST

AP	Acquisition Plan
BCP	Best Commercial Practices
CDRL	Contract Deliverable Requirements List
CM	Configuration Management
CRB	Contract Review Board
DT	Developmental Testing
FAR	Federal Acquisition Regulation
ILS	Integrated Logistic Support
IOC	Initial Operational Capability
LORA	Level of Repair Analysis
LSA	Logistic Support Analysis
MAGTF	Marine Air to Ground Task Force
MARCORSYSCOM	Marine Corps Systems Command
MIL–SPEC	Military Specification
NDI	Non Developmental Item
O&M	Operation & Maintenance
OT	Operational Testing
PCO	Procurement Contracting Officer
PD	Performance Description
PPI	Past Performance Information
RAC	Riverine Assault Craft
R&M	Reliability and Maintainability
R&D	Research & Development
RMA	Risk Management Analysis
RFP	Request for Proposal
SOU	Statement of Urgency
SOW	Statement of Work
TEB	Technical Evaluation Board

1.0 Background

On March 16, 1990 then Commandant of the Marine Corps, Gen A. M. Gray, signed a statement of Urgency (SOU) to procure (6) high speed RACs to support heightened drug interdiction operations by the U.S. Government. The acquisition of armed and highly maneuverable pursuit craft was intended to strengthened the Marine Corps Air-Ground Task Force (MAGTF) tactical capabilities, and drug interdiction proficiency.

In order to meet this urgent requirement, an accelerated acquisition plan (AP) which featured a streamlined NDI strategy was initiated by the Marine Corps Systems Command (MARCORSYSCOM). An informal marketing survey was conducted between April 5–6, 1990 to evaluate possible candidates for a commercial procurement. This survey resulted in a sole source contract award to Sea Ark Marine, Inc., to build (7) craft (funding was allocated to purchase 7 instead of 6 craft) for field user evaluation. The ensuing operational tests of the Sea Ark boats proved satisfactory, and justified an NDI procurement strategy for a follow-on competitive contract.

Swiftships, Inc. was selected from a field of (6) candidate contractors, and awarded a firm fixed price (FFP) contract to build (25) RACs, and to retrofit the (7) boats previously purchased from Sea Ark, Inc. The first RAC was delivered to the Marine Corps in the 3rd QTR FY93. The last RAC was delivered in the 4th QTR FY95 to close out the contract.

The baseline design for the RAC is similar to the craft previously procured from Sea Ark, Inc., for initial operational capability (IOC) testing. The modifications required to militarize the Swiftships craft were accomplished with the guidance provided by the contract performance description (PD), statement of work (SOW), and joint contractor / government design review meetings.

To date however, the RACs have been consistently plagued by a myriad of technical and logistic problems that have uniformly reduced their reliability and maintainability (R&M). Problems ranging from frequent subcomponent failures to supply support inadequacies have continuously degraded its operational availability, and challenged its current support base. The following case analysis provides specific details of the RAC procurement process with the intent of providing lessons learned for future Commercial Item / NDI acquisitions.

> *It is important to remember that the RAC procurement was driven by time constraints imposed by an urgent mission requirement. Thus, it can be postulated that some of the contractual, operational, and programmatic problems revealed in this study, may not have occurred under more "typical" circumstances. Additionally, many of the streamlining and acquisition reform initiatives that are currently practiced by buying activities were not in effect during the time the RAC contract was let.*

2.0 Contract Solicitation & Source Selection

2.1 Contract Solicitation

The request for proposal (RFP) for the production contract specified procurement of a commercial / NDI RAC that met the requirements of the approved PD and SOW. Six contractors responded to the RFP and were subsequently evaluated by the source selection team.

2.2 Source Selection

The source selection process scored offeror's proposals using a 60 /40 rating system with technical compliance weighted more than cost. The proposal evaluation and selection process was accomplished through the use of contract review board (CRB), and technical evaluation board (TEB) personnel. Contract award was based on "Best Value" criteria. Best Value contracts are awarded based on the proposal that is considered most responsive and advantageous to the government, with price and other factors considered.

As determined by the TEB, the combination of technical score plus cost / price was used to determine each offeror's final score. The CRB evaluated the TEB inputs and made recommendations to the procurement contracting officer (PCO) on which offerors to consider for contract award. The TEB evaluated proposals using the following criteria in descending order of priority;

(a) Go / No Go: At a minimum, prospective contractors were expected to meet the requirements listed below. Failure to meet any one of these requirements would have eliminated an offeror as non-responsive.

- Speed – 40 MPH while operationally loaded
- Draft – 2'6" while operationally loaded and stationary
- Endurance – 8 hours operation with 10% fuel reserve (1 hour at maximum speed, 1 hour at idle, and 6 hours on plane)while operationally loaded
- Transportability – internal in C–130/141, external by CH–53E (with and without trailer), over road by trailer and 5 ton truck while operationally loaded. For transportation by aircraft, weapons, antennae, and arches may be lowered or removed from mounts and securely stored in the boat

(b) Performance: Each offeror was evaluated in regards to their ability to fulfill the requirements stipulated in the PD and SOW. Specifically, an assessment of each proposed RAC design was completed to determine;

- Operational effectiveness – the ability to meet the minimum physical, performance, reliability, maintainability, and outfitting parameters of the PD and SOW
- Operational suitability – the ability of the RAC to operate effectively in the environment described in the PD and SOW

(c) Integrated Logistic Support: An evaluation of each offeror's logistic support capabilities was completed to ensure that the RAC could be supported in accordance with the requirements stated in the PD, SOW, and contract data requirements list (CDRL).

(d) Management: Evaluation of the offeror's corporate and personnel experience as related to their ability to meet the objectives of the PD and SOW. This evaluation included, but was not limited to:

- Contractor Facilities
- Personnel
- Experience
- Subcontractor Capabilities

2.3 Pre-Award Survey

Note: Section 2.3 refers specifically to the pre-award survey that was completed on Swiftships Inc. (The contractor that eventually won the RAC contract).

The pre-award survey focused on areas of non-compliance as described by the source selection team's evaluation report. The reported areas of non-compliance were in quality, first article testing (FAT), production approval process, logistic support analysis (LSA), data base approval, design, engineering interface, and warranty.

However, upon completion of the survey, the TEB concluded that "all concerns were alleviated in regards to quality / workmanship issues" at the contractor's plant. The TEB rated the contractor's integrated logistic support (ILS) and configuration management (CM) plan "outstanding" (highest amongst all offerors 82.68/100). In addition, their level of repair analysis (LORA) was reported as "well developed", and company representatives were observed to exhibit good training and practical knowledge of the task. The warranty issue was regarded as a moot point by the TEB, since the standard federal acquisition regulation (FAR) warranty was specified in the contract.

Design concerns were disregarded since the source selection team found the contractor's baseline design similar (in terms of physical parameters, and "identical components) to the previous prototype which had successfully passed IOC requirements". As a result of this, it was thought that the incumbent contractor would require very few hours to accomplish retrofit of the (7) prototype craft previously purchased for IOC. In addition to this, the contractor's management was rated a "outstanding" (90.96/100) by the TEB. The selection criteria used by the TEB was supported by over 25 years of solid boating industry experience, and previous military contracting experience by the contractor.

3.0 RAC Program Issues

For this case study, a thorough investigation of the RAC contract (to include contract mods and amendments), was completed to assess its overall suitability and effectiveness in articulating the RAC performance and ILS requirements. In addition, interviews were conducted with MARCORSYSCOM contracting specialists, RAC program office representatives (Marine Corps), RAC field maintenance and operations personnel, ILS specialists, and contractor administrative personnel, to disclose pertinent information not found in the contract files. The following paragraphs provide background information in regards to the RAC contract procurement strategy, PD, SOW, engineering design, and ILS.

3.1 Procurement Strategy

Market research revealed at that time, that there were no other government R&D procurements or previous designs that would meet the critical performance specifications for the RAC. This in combination with the SOU, the "up front " cost savings, and expeditious nature of commercial acquisitions, reinforced the Marine Corps' decision to buy commercially available products.

3.2 PD / SOW Suitability

In a commercial / NDI procurement, the importance of effectively articulating the performance, suitability, environmental, mission, availability, maintainability, and ILS parameters of an item / system cannot be overemphasized.

In hindsight, the RAC contract PD and SOW did not adequately describe the intended operational and mission environment of the craft. References to the operational environment in the PD (section 3.1) stated that "equipment and material shall be based on known reliability, durability, ease of operation, and safety in the anticipated operating environment."

Environmental requirements in the PD (section 3.2.1.1) read as follows; "the RAC shall be capable of operating in temperatures ranging from 25 degrees to 125 degrees Fahrenheit". In section 3.2.1.2 (6), the PD states that the RAC shall; "be capable of withstanding prolonged exposure to salt laden air in an operational and non-operational mode." Since no other information was provided regarding the operating environment in either document, it was never clearly defined to the contractor.

It can be argued that the lack of a clear definition of the operational environment (in the PD and SOW) may be a prime contributor to the engineering problems that the RACs currently experience. For example, the ability of the RAC to quickly accelerate and decelerate often causes the bow of the boat to dip into the water. It was later discovered that when this occurs, sea water pours over the control panels and gauges inside the vessel. As a result of this, salt water splashes onto wiring harnesses and electrical parts that were thought to be isolated from the environment. This occurrence has led to premature corrosion problems and frequent operational failures.

If the contractor had been aware of the type of maneuvering RACs would typically engage in, it is conceivable that a design alternative would have been proposed to increase the water-tight integrity of the vessel. Additionally, it would have compelled the contractor to install only marine compatible electrical parts for installation.

3.3 Operational Testing / Developmental Testing (OT / DT)

The source selection process did not require the contractor to provide operational testing (OT) and developmental testing (DT) of their proposed design. This requirement was eliminated because of the assumption that the proposed design was "similar enough" to the design procured from the previous contractor, that had passed all IOC test criteria. Based on this fact, it was determined that developmental risk was minimal.

If OT / DT had been completed for the proposed design, it may have revealed differences in maneuverability or other performance areas that would have influenced (or changed) its baseline design characteristics. In addition, OT / DT may have revealed logistic support deficiencies before the contract was let.

3.4 Use of Best Commercial Practices (BCP)

The RAC contract called for the use of BCP in designing and meeting mission performance parameters. While this is an acceptable practice, it should not be implemented without verifying that the product will meet the minimum requirements set forth in the performance specification. As discussed in detail with MARCORSYSCOM personnel, use of BCP verbiage allowed the contractor to use many commercial design and engineering practices that in retrospect, were not suitable for the military environment. In short, buying Commercial Items without verifying that the contractor's BCPs can meet the specified critical performance parameters, may lead to the delivery of goods that do not meet the government's expected performance criteria.

4.0 RAC Engineering / Design Issues

4.1 Design Inconsistencies

While the RAC meets or exceeds many of the performance requirements specified in the PD and SOW, there are many recurring engineering failures and CM problems that should be addressed. Foremost in this discussion is the fact that no two RACs are alike. With the exception of the basic hull design, each RAC has an autonomous design template. Each RAC is different in terms of electrical wiring and subcomponent configuration. These are just a few examples of the design inconsistencies that have been reported by the Marine Corps. The following engineering product deficiency list compiled by the MARCORSYSCOM further exacerbates the problem;

- Wiring of electrical harnesses, gauges, connectors, are different
- Electrical wiring that goes no where
- Routing of water pipes are different
- Engine valve configurations are different
- Different depth finder, radar, GPS, and LORAN systems
- Different fuel injector and fuel line routing
- Different locations of compass, fuel and temperature sensors
- Different length and routing of steering control lines
- Different fire extinguisher systems
- Different hull welding braces
- Cabling to rakes are different
- Deck plate screws are different
- Different engine configurations
- Marine strainers in need of redesign

4.2 Improper Parts Selection

Many subcomponents used in the RAC systems design were not intended for use in the marine environment. For example, the electric starters and solenoids that were used were non-water tight components. Further, the position of the starters and solenoids installed on the Cummings diesel engines placed them near the bilge areas where they were constantly exposed to salt water splash.

Other problems cited bilge pump connectors and heating solenoids that were not isolated from bilge water, causing premature corrosion and failure. The wiring harness connectors that were selected for use (which met commercial standards) were non water-tight, and continue to fail repeatedly from exposure to the sea water environment.

4.3 Control Gauges

Control gauges that were selected for installation by the contractor were not intended for prolonged operation in the salt water air environment. They were cheaply constructed and made of non-similar metals which increased the occurrence of corrosion, malfunction, and replacement, by maintenance personnel.

4.4 Wiring Safety

Unanticipated exposure of wiring and electrical components to the corrosive sea environment has created general safety and fire hazards for RAC personnel. The frequency at which wiring problems have occurred has prompted the RAC program office to develop and separately fund, an engineering change proposal (ECP) to overhaul the electrical systems of all RACs. Implementation of this ECP is expected to improve CM concerns and minimize the potential for electrical fires aboard RACs. It should also improve the reliability of the RAC's electrical systems and reduce future operational and maintenance (O&M) costs for the RAC program.

4.5 Design Issues

Interviews with MARCORSYSCOM contracting specialists revealed that voluntary design reviews were conducted (by the contractor) at the beginning stages of RAC engineering development. U.S. Navy Project Office, MARCORSYSCOM, Marine Corps operations, and contractor engineers, initially worked together to plan out the details of gauge installations, control panel configurations, as well as other government design requests. This cooperative review process was continued up until the critical design review phase, when the design configuration was "locked down".

In many cases however, contractor installation practices did not reflect the design agreements established as a result of these reviews. Compliance with the design team's inputs would have resulted in the production of RACs that were very similar, if not "identical" in their CM. Conversely, more efficient inspection / acceptance techniques by government representatives may have discovered these CM inconsistencies that are now all too obvious and costly to fix.

The cumulative result of the engineering deficiencies specified in sections 4.0 through 4.5 have resulted in a reported operational availability of only 50–60% at any given time. It has further created a requirement for separate and continuous funding for repairs from the program office.

5.0 Integrated Logistic Support

5.1 ILS Deficiencies

As previously mentioned, the operational availability of the RAC has been estimated to be between 50–60%. This is due directly to the RAC's electrical wiring and subcomponent failures, and indirectly to the lack of ILS planning and support. If the maintenance and logistic support for the RAC had been better planned, it is likely that the Marine Corp would have a more effective means of repairing and supporting the RAC. Further, it is reasonable to assume that better ILS planning would have resulted in a much higher operational availability for the RAC, and lower overall lifecycle costs.

5.2 Support Planning

The overarching objective in support planning is to minimize the total cost of ownership to the government. Although the RAC contract required interim spares support, there was no long term plan for ILS. The U.S. Marine Corps supply system is not geared towards total support of Commercial Item / NDI systems, especially in cases where (relatively) small numbers of systems (RACs) are procured. Alternate support plans were not developed when this procurement was initiated, which now results in an expensive support problem for the RAC program office.

Further research into this area uncovered the enormity of this problem. For example, it was learned that even with a direct purchase order, it can take up to 30–45 days to procure parts for the RAC. Additionally, maintenance personnel are burdened with the task of locating parts (most without national stock numbers), and coordinating open purchase transactions which are cumbersome at best in terms of standard military support procedures.

5.3 Technical Documentation

Technical documentation for the RAC is grossly deficient in terms of technical manual content, parts control, CM, and R&M data. The Marine Corps project office has been left with the task of funding, developing, and providing the RAC community with technical data that was required under the original terms of the contract, but never wholly delivered.

5.4 Configuration Management

CM should be addressed to the maximum extent possible to document the physical and functional characteristics of Commercial Item / NDI systems. As with any commercial product, the manufacturer is not required to maintain a particular product configuration for their customer base. Commercial Item configuration changes occur as frequently as needed by the contractor to support new technologies and product improvements.

Since CM was not adequately addressed in the RAC acquisition, the repair and maintenance of the craft is at best, inefficient. Form, fit, and function, is not consistent in any of the RACs, creating variances in how each RAC is maintained and supported. For example, if replacement of a new depth finder, radar, or GPS system is required, maintenance personnel typically have to re-wire the electrical system to accommodate this configuration change. This further exacerbates the CM problems that already exist between RACs.

This case study reflects the types of challenges that can occur in commercial procurements. While the following sections (6.0, 7.0, and 8.0) provide lessons learned specifically from the RAC procurement, they can (and should) be applied to all government sponsored commercial acquisitions.

6.0 Programmatic Lessons Learned

6.1 Develop Contract Coordination Teams

Improved coordination between contracts, ILS, and engineering / technical personnel, should be encouraged throughout the contract process to improve the clarity of RFP solicitation requirements, and to properly evaluate offerors proposals. The use of contract coordination teams would enhance the buying activity's ability to assess and select contractors that meet the program performance and support criteria.

6.2 Perform Comprehensive Market Research

The FAR identifies market research as the "first step" in the government procurement process. It is important to realize that market research is not limited to determining the availability of a Commercial Item or NDI which meets certain performance criteria. When properly completed, it also determines a contractor's ability to provide buyer warranties and support of fielded systems.

The success or failure of a commercial contract depends on how thorough the buying activity is in researching the marketplace for products that meet the operational criteria, and for contractor's that can fulfill the support criteria set forth by the system / item requirements. In any case, proficient market research will support the development of an effective and successful acquisition strategy.

6.3 Improve RFP Solicitations

The content of future RFPs should include verbiage which specifically addresses the extent of logistic support desired for the proposed program. Too often, the RFP process fails to establish even minimal logistic support requirements for offerors to consider in their proposals. An RFP that clearly describes the required program logistic support parameters, will quickly eliminate many bidders that may have otherwise been considered in the source selection process. This screening technique would save on resources typically expended during the proposal evaluation process, and allow for more effective use of acquisition funds.

Further, RFPs should include contract language which encourages selection of contractors who utilize current acquisition reform initiatives. Contractors who use contemporary streamlining processes in the performance of their contracts are usually more efficient and responsive to the government's needs.

6.4 Improve the Pre-Award Evaluation Process

The pre-award evaluation process must be improved to ensure that it is accurate and meaningful. A well trained and knowledgeable evaluation staff is essential to performing expert investigations into the contractor's facility and processes, and should result in the selection of the best qualified vendor.

6.5 Perform a Risk Management (RMA) Analysis

It is essential that a risk management analysis be performed for commercial procurements. A RMA would identify programmatic risk areas and recommend corrective actions to reduce risk to an acceptable level. Additionally, a RMA would enhance management of the acquisition process and help ensure that the government has accounted for all possible pitfalls in the acquisition, support, and lifecycle management, of commercially procured systems.

Use of a RMA during execution of the RAC contract would have been useful in forecasting contract performance concerns and engineering issues before they became problems. In any case, a RMA that identifies even minimal areas of concern is well worth the effort in terms of its cost saving potential to the government.

6.6 Require PPI

Past Performance Information (PPI) should be required of all offerors to better assess their production, management, and support capabilities. PPI includes, but is not limited to, the contractor's record of meeting requirements of quality and workmanship, forecasting and maintaining cost thresholds, and customer satisfaction. At a minimum, the use of PPI will help contracting officials evaluate the basic credibility of an offeror's proposal and capabilities.

For reasons unknown, PPI (termed "history" in the RAC contract) was initially requested in the RAC contract but was deleted as a requirement by the contracting activity. PPI should be required in all commercial contracts to be used as a formal indicator of how well a contractor will perform.

It is also recommended that those solicitations that do require PPI, include validation of the contractor provided information by representatives of the Defense Contract Management Command (DCMC). This additional step will minimize unsubstantiated statements / claims by contractors from influencing the source selection process.

6.7 Write Concise CDRLs

Contract CDRL packages must be written to convey clear, concise, requirements, and be consistent with current commercial practices. In any case, every effort must be made by contracting officials to eliminate the possibility of subjective interpretation of CDRLs by offerors.

6.8 Negotiate Better Contract Warranties

Many of the engineering problems that RACs are experiencing result from prolonged exposure of non-marine subcomponents to the salt water environment in which they operate. Corrosion of gauges, wiring connectors, and electrical parts, took time to develop, and occurred outside of the one year warranty provided by the contractor.

Future commercial contracts should consider procuring more effective, longer term warranties from the contractor in cases where PPI indicates sufficient risk to the government. If properly assessed, this analysis can determine the merit of buying an extended warranty plan, and / or provide an alternate course of action to cover the projected risk.

6.9 Stay abreast of Acquisition Reform Initiatives

Contracting and program management personnel should continually improve their knowledge of current acquisition practices. Interaction with DoD personnel knowledgeable in acquisition reform can provide invaluable guidance in procurement streamlining practices, and in addressing commercial issues.

The Acquisition Reform Office (ARO) is are staffed with professionals that specialize in program management, acquisition, technical, and government / industry matters. Their input can help tailor an effective procurement strategy that meets the objectives of the procuring activity. The ARO also develops, manages, and distributes many publications, newsletters, and training aids, that can be used as general guidance when developing Commercial Item / NDI RFPs and contract strategies.

7.0 Engineering / Design Lessons Learned

7.1 Improve the Content of the PD and SOW

The lack of information in certain areas of the RAC contract's PD and SOW may have contributed to the current design flaws. Operational and mission requirements were not fully disclosed in either document. If this information had been provided to the contractor, it may have prompted design solutions to the operational problems that the RAC is currently experiencing. Additionally, a clear understanding of the type of maneuvers the vessel would be challenged with, may have prompted RAC design proposal alternatives that could have improved its overall performance and reliability.

Future contracts should include PDs and SOWs that provide a comprehensive description of the operational, mission, repair, availability, maintainability, and support requirements, for a given system / item.

7.2 Develop Verification Testing

In lieu of FAT for commercial procurements, contract requirements should require verification testing of contractor furnished performance data. Verification testing should place the system / item to be tested in a scenario that mirrors its intended operational environment.

If engineering design verification testing had been required and completed for the RAC, it may have revealed performance deficiencies that could have been addressed and corrected in the production phase by the contractor.

7.3 Make Operational Testing (OT) a Mandatory Requirement

Lessons learned from the RAC procurement emphasize the need to perform a formal evaluation during the source selection process on each prospective candidate. This evaluation process should include OT to reveal any engineering design or logistic deficiencies which need to be addressed by the contractor "prior to contract award". In the RAC procurement, completion of OT may have revealed operational and logistic problems that could have been corrected prior to contract award.

7.4 Use Standard Acceptance Practices

Standardized acceptance procedures should be used for all commercial systems. Use of uniform inspection /acceptance procedures for the RAC by government representatives would have minimized the system configuration and design inconsistencies that have been exposed in this case study.

8.0 ILS Lessons Learned

8.1 Invest in Supply Support

Trade-offs are inevitable in commercial procurements, but the government cannot afford to trade "up front" R&D savings for the long term costs of inadequately planned or funded logistic support. ILS support issues must be addressed during the market research phase of the contract process to properly evaluate and plan for the projected system lifecycle costs. Comprehensive market research will reveal whether the contractor is capable of providing adequate support, warranty, and maintenance, of delivered items.

As previously mentioned, a "contract coordination team" which uses knowledgeable logistics and engineering personnel from both government and industry, would provide invaluable insight to program managers in defining and planning an effective support posture.

8.2 Develop Alternate Support Plans

Urgent procurement requirements often preclude planning for adequate system logistics, CM, and supportability. Buying activities must ensure that alternate support structures are planned (early on in contract negotiation) to cover both interim and long term logistic needs.

As a result of limited funding and time constraints that hindered proper support planning, the RAC program office is currently struggling to find resources (funding) which will provide even basic logistic support.

Expenses to correct product, programmatic, and supply support deficiencies for the RAC, is estimated by the program office to be $868K for FY92–95, $641K for FY96, and $2,347K for FY97 and beyond. The total "estimated" support cost to include past, present, and out years for the RAC program is $3,856,000, which exceeds the original contract price.

8.3 Benchmark Successful Commercial Item/NDI ILS Practices

Supplemental research completed for this analysis has revealed possible success stories in the area of commercial / NDI ILS. The U.S. Navy's MK 5 Patrol Boat Program has adopted an innovative approach to solving Commercial Item /NDI ILS deficiencies which involves teaming with the original equipment manufacturer to define the logistic requirements of the vessel.

A commercially procured ILS package was funded by the program office to minimize down time for the patrol boats. This approach was taken because "initial attempts to involve the standard Navy supply support system proved ineffective in meeting their needs.

This "up front" ILS planning and funding strategy takes a proactive approach to providing comprehensive ILS support of commercial systems. It also addresses lifecycle maintenance planning through an independent repair / logistic support facility. This type of creativity is needed when developing commercial / NDI support strategies, and should be regarded as a benchmark case for future support efforts.

8.4 Address CM as a Priority

CM is non-existent for the RAC program. While this area is always going to be a source of concern for commercially procured systems, there are steps that can be taken to lessen the burden of support. Future contracts should require full disclosure of item part numbers, NSNs, serial numbers, etc., as well as the details of "planned" configuration changes from the contractor. Prior knowledge of planned commercial configuration changes may initiate engineering solutions or alternate strategies that can accommodate CM changes as they occur.

Additionally, the government should invoke long term contractual requirements on the vendor to support system documentation, spares support, special tools, etc. for equipment and support practices which become obsolete during the program's lifecycle.

8.5 Require R&M and System Failure Data

Contract CDRL verbiage must ensure that full disclosure of R&M data is provided as part of the proposal for a proper analysis of system components and subcomponents. R&M data was not required by the government in the RAC procurement, and ultimately resulted in the use of some inferior subcomponents in the RAC configuration.

In most cases, failure to require and analyze R&M, Mean Time to Repair (MTTR), and Mean Time Between Mission Critical Failure (MTBMCF) data will lead to false expectations in both the performance, and projected support requirements of the procured system.

At a minimum, procuring activities should ensure that the contract contains an option for parts / technical data "buyout" in cases where the procured technology becomes obsolete or is discontinued by the manufacturer.

8.6 Ensure Proper Technical Documentation is Provided

Since level III drawings will rarely be an option for commercial procurements, buying activities must ensure that at a minimum, adequate technical information essential for repairs and supply support, is delivered by the contractor. Access to pertinent (and accurate) technical documentation will ease the burden of Commercial Item repair and provisioning processes.

Additionally, contractual clauses should also be included in commercial contracts which will ensure that the contractor updates the governments technical documentation package (as needed) to reflect CM changes as they occur.

9.0 Conclusions

The Secretary of Defense has challenged the DoD community to change its acquisition paradigm and move towards performance based Commercial Item / NDI acquisition strategies. If carefully planned and executed, Commercial Item / NDI procurements will save the government time and money, and allow the end item user to effectively own, operate, and support, state of the art technologies

The problems that were revealed in this case study are not uncommon to other

Commercial Item/ NDI procurements. As such, program managers and the acquisition community must become more innovative in their procurement strategies, and adopt new methods to support Commercial Item / NDI systems.

Whether the procurement specifies a stand alone or system level item, the initial solicitation should be structured to ensure that the procuring agency's requirements are precisely established. Commercial Item / NDI RFPs, SOWs, performance specifications, and contract CDRLs must be markedly specific in their statement of the government's requirements to avoid subjective interpretation by offerors.

Every RFP that specifies use of Commercial Item / NDI will have its own specific idiosyncrasies which will make it unique from the next one. What buying activity and contracting personnel need to understand is that sound Commercial Item / NDI contracting principles must be used and "tailored" to maximize benefit to the government, and ensure quality of product to the Systems Command.

In order to achieve this goal, teaming efforts must be established early in the acquisition process to include knowledgeable engineering, technical, logistic, contracts, and operational persons, to clearly define and plan all phases of the procurement strategy. Through the use of lessons learned, buying activities can become more proficient at planning and implementing Commercial Item / NDI procurement strategies.

Finally, the acquisition community must continue to educate itself in all related areas of acquisition reform, technology, and advanced ILS strategies in order to maximize the government's vantage point and its return on commercial acquisitions. Knowledge of one discipline without the other is self defeating and counterproductive. In order to meet the challenges of the burgeoning Commercial Item / NDI arena, buying activities must (a) learn from previous acquisition mistakes, (b) become more innovative and flexible in planning and obtaining commercial support, and (c) commit to an "effective" and lifelong partnership with industry and acquisition reform agents.

The DoN Acquisition Reform Office encourages use of their Home Page for the latest information regarding acquisition reform initiatives, policies, and procedures. Our Home Page address is;
http://www.acq–ref.navy.mil

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